of the opening should be colored yellow if the secretions pass through freely.

Caldwell, in 1893, called attention to the desirability of preserving the canaliculus, as by its capillary action it causes the tears to flow into the sac. When it is slit this action is destroyed and is apt to interfere with proper drainage. Since doing the intranasal operation I have become convinced, at least to my own satisfaction, of the advisability of leaving the canaliculus intact.

Where drainage is free the patients will sometimes remark that they feel air blowing in their eye when forcibly blowing their nose. This is more pronounced in those cases where the canaliculus has been slit. Usually it is of little importance but in my estimation is a distinct danger and the operation contra-indicated where a cataract or other intraocular operation has to be performed.

In cases where there is a marked deviation of the septum to the side of the stricture, a submucous resection may have to be done before access can be had to the operative field.

The following cases will illustrate the manner in which recovery takes place in those patients where the operation has been successfully performed:

Case 1. Mrs. L. C., age 33. Epiphora of right eye began about Feb., 1911, when patient went to a general practitioner who prescribed drops, but obtained no relief. Three months later felt a lump over region of sac which on being pressed forced out pus.

Then went to specialist who advised removal of sac, but patient refused. In 1912 went to one of the local clinics where the canaliculus was slit but no probes were passed. No benefit resulted. Later went to another clinic where an attempt to pass a number two probe failed on account of stricture being present.

Nov. 13, 1913, was referred to me for operation. On examination I found right lid thickened, conjunctiva inflamed, swelling over region of sac, canaliculus slit. I operated intranasally and on opening sac a large amount of pus exuded. Irrigated daily till Nov. 26th, free drainage being present all the time. Dec. 1st patient discharged, cured. Feb., 1914, four months after operation, drainage is free and patient entirely well.

Case II. Mrs. T. C., age 45. Complains of eyes watering for past six years, during which time much pus was present. Was treated for four or five years with probes but obtained no relief. In June, 1912, came to San Francisco, where treatment with probes was continued after right canaliculus was completely slit and left, partially. No improvement. August 1, 1913, was referred to me. I operated intranasally on left side. Some pus exuded at the time. Aug. 2 very good drainage. Irrigated daily for about a week. Aug. 15, healing complete and condition cured on left side. Aug. 15, operated on right side. Has high deviation of septum to right but patient refused submucous resection so had some difficulty on account of nearness of septum to right lateral wall. Obtained free drainage but for fear of having adhesions form between the septum and operated area, treatment was continued to Nov. 15, longer than usual, when patient was discharged cured. Feb. 3, 1914, drainage free on both sides. No epiphora or other symptoms of dacryostenosis. Fluorecein passes freely through both sides.

Discussion.

Dr. Kiefer, Los Angeles: For how long a time have those operated cases been followed? It would seem that there would be great danger of closure of the artificial opening into the nose, such as frequently follows operations on the antrum of Highmore.

Also discussed by Dr. Hulen, of San Francisco.

Dr. Green: In answer to Dr. Kiefer's remark that the opening into the sac may close, I must say that this is true if it has not been made large enough. It happened in my first cases, where I did not remove enough tissue. When enough bone and sac has been removed, this will not happen.

SHOCKLESS SURGERY.*

By A. B. COOKE, M. D., Los Angeles.

For many years it has been conceded that the greatest danger of modern surgery consisted in the ever-present possibility of surgical shock. With the epoch-marking discoveries of anesthesia and, later, of antisepsis the chief obstacles disappeared. But it was recognized that there still remained a danger, insidious and menacing, which all too often thwarted the efforts of the most painstaking and skillful operators. To overcome this danger one authority taught that speed in operating was the remedy, another that perfect hemostasis was the great desideratum. And still there constantly occurred and are occurring cases in which life is jeopardized, indeed often sacrificed by the advent of conditions which seem to mock the precautions of the most brilliant clinicians.

The picture is familiar to all. A patient whose general physical condition is excellent, is subjected to an operation in itself not particularly formidable and which is performed with reasonable skill and dispatch. He comes off the table at the end of forty-five minutes or an hour a shaken and battered wreck, with features of a ghastly pallor, drenched with perspiration, pulse rapid and thread-like, respiration shallow and sighing, pupils irregular,—in short, presenting every appearance of impending death and requiring the most intelligent and unflagging attention for hours to stem the ebbing tide of vitality. This is surgical shock. Every surgeon of large experience has seen it time and again, and the aggregate of the anxious hours he has spent because of it would form a large chapter in the record of his professional life.

Since the publication by Dr. Geo. W. Crile in 1897 of the thesis which won the Cartwright prize he has been regarded as the foremost authority upon the subject of shock. After years of patient study and a prodigious amount of experimental investigation he now tells us that he has perfected a system or method by means of which surgery may be practically freed from this great source of danger. Those who know Dr. Crile, his integrity as well as his preeminent ability, can not but listen with respect to any utterance he may make upon the subject.

Anoci-association is the name applied to this new method of shockless surgery. That we may the more readily comprehend the principles in-

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volved, let us take a brief glance at the theory underlying it.

In his primitive state the two most important problems presented to the ancestral man were the securing of food, and escape or defense from threatened danger. The solution of both these problems depended upon muscular exertion, and in consequence the motor function of man, as of other animals, became highly developed and specialized. While modified in some degree in the gradual process of adaptation to altered environments, the physical characteristics of the man of to-day remain essentially the same as those of his phylogenetic forbears. Thus we observe that the portions of the body most abundantly supplied with sensory nerve-endings are, generally speaking, the anterior portions,—those most exposed to injury in attack,—while the posterior portions are markedly less susceptible to pain and the internal organs are comparatively non-sensitive.

Irritation of a sensory end-organ anywhere is followed by a definite sequence of events, i. e., perception of the painful sensation by the brain centers and the immediate automatic liberation of a motor impulse designed to ward off the harmful agent or to remove the offended member from the zone of danger. Fear also plays a part and however well controlled in its manifestation, adds a disturbing psychic factor to the physical phenomena thus inaugurated.

Under inhalation anesthesia two things only are accomplished, namely, consciousness is abolished and the power of voluntary motion is paralyzed. The sensory nerve-terminals are as capable of being irritated, the afferent nerve tracts are as capable of transmitting painful impressions and the brain cells are as capable of receiving them and of discharging efferent impulses, as though the patient were fully conscious. This has been conclusively demonstrated both in the laboratory and in the autopsy room. Sections from the brains of traumatized animals and from human beings dying in shock show easily recognizable alterations from the normal, the individual cells differing both morphologically and in their staining properties. And this is equally true whether the subjects were under inhalation anesthesia or not.

The conclusion is that the pathologic entity underlying shock is brain cell exhaustion resulting from the constant futile discharge of motor impulses in response to prolonged peripheral stimulation or irritation. As a consequence of this fatigue there is a progressive reduction of the blood-pressure, the vaso-motor centers become incapable of functionating because of the resulting anemia, and the condition we know as shock follows.

The foregoing is a brief summary of Crile's conception of the nature and mode of production of surgical shock. His conclusions are not universally accepted. In a recent rather labored article by Janeway and Ewing,[1] based, it would seem, upon a wholly inadequate series of laboratory experiments, it is categorically denied that the stimulation of sensory nerves is capable of producing either exhaustion of the brain centers or any considerable degree of reduction in blood-pressure. It is interesting to note in passing that these investigators attribute shock to loss of vaso-motor control superinduced by the hyperrespiration incident to ether anesthesia, to loss of blood, and to visceral trauma.

It is not without considerable significance that, in contrast with the dozen or so laboratory experiments and the relatively short time devoted to them by the above writers, Crile's researches included more than 1200 animal experiments extending over a long term of years, in addition to the careful clinical observations possible only in an extensive surgical practice.

Our chief concern at this time, however, is not with the theoretical, but with the practical,—not with the physiologic and laboratory phases of the subject, but with the clinical. Whatever the true nature of shock and the exact mechanism of its production, there can be no dissent from the proposition that its prevention is supremely desirable. If the hypothesis is admitted that the conductivity of the afferent nerve tracts and the ability of the brain cells to perceive stimuli are not abolished nor appreciably diminished by general anesthesia, it becomes at once apparent that neither theoretical objection nor captious criticism should deter us in the adoption of every additional expedient which has proved its value in lessening operative hazard.

The cardinal principles of anoci-association are four in number, namely:

1.—A preliminary hypodermic injection of morphine (gr. 1/6) and scopolamin (gr. 1/150) one and a half hours previous to the operation, repeating the injection an hour later in half the dosage, if the desired effect is not obtained.

2.—The administration of nitrous oxide and oxygen as a general anesthetic, instead of the customary ether.

3.—Complete blocking off of the field of operation by the infiltration of a weak solution (¼ per cent) of a quickly acting non-toxic local anesthetic, preferably novocain.

4.—At the completion of the operation the infiltration of all tissues traumatized (except the skin) with a mild solution (¼ to ½ per cent) of quinine and urea hydrochloride.

It would manifestly be impossible within the time limit allotted to this paper to discuss these several principles in detail. And it would probably be unnecessary to do so before this body in any event. But it may be emphasized that no one of them is unimportant. Together they constitute a definite, thoroughly tested system, and each step is absolutely essential to its successful application.

It is at once evident that the only feature of the method requiring especial skill and training on the part of the operator is the technic of the local anesthetization. To accomplish its object this must be as complete and perfect as though no general anesthetic were to be employed. With-

out experience along this line no one can expect to be entirely successful either in his first or his first half dozen cases. On this point Bloodgood pertinently says:[2] "No surgeon who has not performed many operations under local anesthesia only, will be able to get the same results from the combined method. When the patient is awake and you attempt an operation under local anesthesia, you will always be informed when a painful act takes place, and you will be surprised at the difficulty of making such an operation perfectly painless. . . . It is my opinion that the first step in the development of this new technic is to perform as many operations as possible under local anesthesia."

A distinct advantage of the method which is often overlooked in discussing it, is that it encourages, in fact compels, gentleness of manipulation. Nitrous oxide anesthesia maintained within safe limits is never as deep and death-like as that of ether and undue traction and trauma are much more apt to be resented by muscular contraction and rigidity. Rapidity in operating is, of course, desirable, provided it does not necessitate the sacrifice of thoroughness and due respect for the tissues. The surgeon who is too busy to concede the possible advantage of gentleness in his work will naturally have little patience and less success with this method.

Closing,—the real benefits of anoci-association in preventing post-operative pain, shortening the period of post-operative disability, and saving life have been emphatically attested by such well-known surgeons as M. L. Harris, Bloodgood, Cabot, Carr, Lower and a host of others, in addition to Crile. The first mentioned (Harris[3]) goes so far as to say that he has practically discarded general anesthesia and believes the method of nerve-blocking alone is so simple, so successful and possesses so many advantages that it marks the passing of the general anesthetic in surgical operations. This is truly "a consummation devoutly to be wished;" but few, perhaps, have as yet acquired sufficient exuberance of enthusiasm to endorse so radical a statement.

My own personal experience with the method embraces approximately 150 cases covering a wide range of different operations. Basing the observation on this personal experience I do not hesitate to say that in my opinion anoci-association represents the most notable step in the progress of surgery within the past two decades. Aside from the relief of human suffering and the saving of life, I count it the most gratifying feature of my surgical experience to have been able to perform a considerable number of major operations and find my patients uniformly in as good or better condition at the conclusion as at the beginning,—free from shock and with every promise that the period of disability would be both shorter and comparatively free from discomfort.

1. "The Nature of Shock." Annals of Surgery, Feb., 1914.
2. "Studies in Blood Pressure," etc. Annals of Surgery, Dec., 1913.
3. "Nerve Blocking," etc. Journal A. M. A., Sept. 27, 1913.

THE NURSING SITUATION SINCE THE PASSAGE OF THE LAW.*

By GERTRUDE S. COURTRIGHT.

In approaching the discussion of a subject upon which such divergent views have been expressed, and which has been a basis for acrimonious private debate as well as legal argument, the task of treating the topic of this paper, in other than a partisan manner, is almost impossible. Naturally I will be charged with partisanship, irrespective of any observations that I may record, because of my personal efforts in connection with this particular legislation, no matter how accurate those observations may be—no matter how unaffected I may now be, personally, by the results that will follow, "as the night the day," upon the operation of this enactment of our legislature. Assuming that such an accusation of partisanship must therefore follow any article prepared by me—willing, nevertheless, under such conditions, to express my deductions, I wish to first make clear, if I can, the legal theory of such a law, and these preliminary statements are but an attempted repetition of information concerning the law applicable to the subject, and hence probably not as entirely correct as a lawyer would give it. The statute now provides, "No female shall be employed in any manufacturing, mechanical, or mercantile establishment, laundry, hotel, public lodging house, apartment house, hospital, place of amusement, or restaurant, or telegraph or telephone establishment or office, or by an express or transportation company in this state more than eight hours during any one day, or more than forty-eight hours in one week. The hours of work may be so arranged as to permit the employment of females at any time so that they shall not work more than eight hours during the 24 hours of one day, or 48 hours during any one week, provided, however, that the provisions of this section in relation to hours of employment shall not apply to nor affect the harvesting, curing, canning or drying of any variety of perishable fruit or vegetables, or to graduate nurses in hospitals." You will note that the statute in question arbitrarily designates certain classes of work and business in which, irrespective of the nature of the duty or work to be performed, a woman shall not be employed more than eight hours per day or 48 per week.

It has always been the assertion of those who have striven for the enactment of legislation limiting the hours of labor, that the purpose of such a law was the protection of women whose work was of such a character that long continued and closely confined duty in the performance of the work was detrimental to their health, and that, because of their "child-bearing possibilities," the health concerned must be protected and conserved against the demands of thoughtless and heedless employers.

No one will doubt that such legislation is not only beneficial to, but absolutely necessary, in behalf of many women whose earning methods and powers are limited, and with this legislation, when enacted

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